

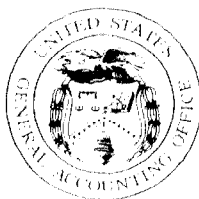
GAO

Report to the Chairman,  
Subcommittee on Health for Families  
and the Uninsured, Committee  
on Finance, U.S. Senate

May 1991

# TRAUMA CARE

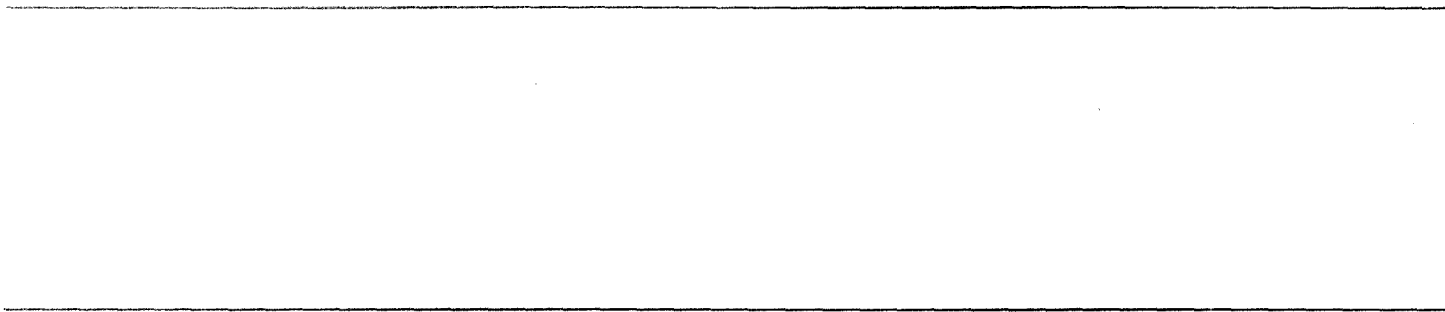
## Lifesaving System Threatened by Unreimbursed Costs and Other Factors



143946

RELEASED

**RESTRICTED**—Not to be released outside the  
General Accounting Office unless specifically  
approved by the Office of Congressional  
Relations.





United States  
General Accounting Office  
Washington, D.C. 20548

---

Human Resources Division

B-242551

May 17, 1991

The Honorable Donald W. Riegle, Jr.  
Chairman, Subcommittee on Health for  
Families and the Uninsured  
Committee on Finance  
United States Senate

Dear Mr. Chairman:

In response to your request, we have prepared this report, which discusses factors that influence urban area trauma center closures. It provides information on the reasons hospitals in major urban areas withdraw from trauma care systems that serve people with life-threatening injuries.

As you requested, we did not obtain written comments on the report. Unless you publicly announce its contents earlier, we plan no further distribution of the report for 30 days. At that time, we will provide copies to the Secretary of Health and Human Services, the Director of the Office of Management and Budget, and other interested parties.

Please contact me on (202) 275-5451 if you or your staff have any questions concerning the report. Other major contributors are listed in appendix IV.

Sincerely yours,

A handwritten signature in black ink that reads "Mark V. Nadel". The signature is written in a cursive style with a large, stylized "M" and "N".

Mark V. Nadel  
Associate Director, National and  
Public Health Issues

---

# Executive Summary

---

## Purpose

Injury kills more people under age 45 than any other single cause. It is the fourth leading cause of death among all Americans, killing about 140,000 annually. Estimates of the cost of initial hospitalization for severe injury—trauma—in 1988 were as high as \$6 billion. The average charge per hospital admission for a trauma patient is three times higher than that for a regular acute care admission.

In many areas where trauma care systems are established, timely and appropriate medical care reduces the death and disability of trauma victims. While such a system has several key components, its heart is the network of hospital trauma centers that surgically treat life-threatening trauma injuries. However, many hospitals that make up trauma systems are struggling to keep their centers open. Nationwide, about 60 trauma centers have closed in the past 5 years leaving about 370 designated to provide trauma care. Major urban areas are particularly hard hit. Closing more centers could threaten access to treatment of severe injury for many Americans in some metropolitan areas.

At the request of Senator Donald W. Riegle, Jr., Chairman of the Subcommittee on Health for Families and the Uninsured of the Senate Committee on Finance, GAO examined the reasons for trauma center closures in major urban areas. This report presents our findings.

---

## Background

Trauma care systems are designed to prevent death and reduce disability from trauma injuries where possible. They are organized to rapidly identify and transport severely injured people to definitive care provided by hospital trauma centers. Trauma centers are specialized hospital units with surgical and medical specialists, laboratory services, and operating and critical care facilities available to treat severe injuries 24 hours a day.

Nationally, blunt trauma—caused by motor vehicle crashes, falls, or other blunt forces—represents about 80 percent of trauma injuries. However, penetrating trauma, primarily caused by guns and knives, represents a growing share of urban trauma injuries. This is particularly true in inner-city areas where crime- and drug-related violence has been rising. Many hospital officials point to this shift in patient mix as a force that contributes to their deteriorating financial position and decision to end participation in organized trauma systems.

As penetrating injuries increase, strategies aimed at preventing or reducing the incidence of these injuries could benefit hospitals and the

---

American public as a whole. Among such strategies, research experts suggest, are automatic protection provided through product design and individual behavior change required by law.

Few states have established trauma care systems. But recently, through adoption of the Trauma Care Systems Planning and Development Act of 1990, the federal government has encouraged the development of regional trauma systems. An initial \$60 million is authorized for this purpose, and states may apply for a waiver to use a portion of the federal funds to reimburse uncompensated costs of trauma care. To receive a waiver, a state must demonstrate that its trauma care system meets certain standards and represents optimal trauma care.

For this study, GAO interviewed hospital officials and obtained financial and/or statistical data from 35 designated trauma centers. The centers are located in six major urban areas, Chicago, Detroit, Los Angeles, Miami, San Diego, and Washington, D.C.

---

## Results in Brief

Urban trauma care systems are threatened as many trauma centers have shut their doors to trauma patients. Providing trauma care is expensive, and treatment costs usually exceed patient revenues in urban centers. In the six cities GAO reviewed, more than a third of the trauma centers stopped providing trauma care to severely injured people—closed—within the last 5 years. Primarily, the closures were due to financial losses sustained from treating the uninsured and patients covered by Medicaid and other government-assisted programs (see p. 23).

Centers remaining open face growing financial losses. Compounding the problem of a growing uninsured population and rising urban violence in their treatment area, open centers must deal with the unreimbursed costs of treating the uninsured and government-assisted program beneficiaries who would have been treated in the centers that have closed (see p. 26). Many of these centers, officials say, may be unable to remain open without some way to stem financial losses from uninsured, Medicaid, and other government-assisted program patients.

The intense demand for medical services generated by trauma centers disrupts nontrauma hospital care and physicians' private practices, creating further pressures for trauma center closures. For example, surgeries and X-rays for nontrauma patients are often rescheduled to accommodate the trauma patients' urgent care needs.

---

## Principal Findings

---

### Unreimbursed Hospital Costs Primary Cause for Closures

Although hospitals expected that operating a trauma center would be expensive, most have found the financial strain to be greater than anticipated. Many have concluded that the financial losses cannot be borne. Of the 35 trauma centers GAO reviewed, 15 have closed—12 primarily because of financial losses. Most of the currently operating trauma centers reviewed lost money. Some hospital officials said they might not be able to keep their trauma centers open in the face of continuing losses.

The financial distress of many urban trauma centers results from the high costs of treating severe trauma injuries and the limited reimbursement by uninsured patients and government-assisted programs. Medicaid and other assistance programs usually do not fully reimburse hospitals for trauma care costs. For 28 hospitals able to measure their annual losses from uncompensated care that trauma centers provided, such losses ranged from \$100,000 to \$7 million. Total losses for their most recent year of operation were \$65.5 million. The volume of uninsured patients, who pay little or nothing, and government-assisted program beneficiaries is proportionately greatest in major inner cities. Federal law requires most hospitals with emergency facilities, including trauma centers, to treat all emergency patients without screening for ability to pay. But Medicaid, a federally aided, state-administered medical assistance program, and other government programs do not compensate for all losses trauma centers sustain in fulfilling this mandate.

---

### Financial Losses Worsened by Increases in Uninsured and Violence, and “Domino Effect”

Several other factors have exacerbated financial losses for urban trauma centers. Between 1977 and 1988, the number of uninsured people under age 65 increased from 26 million to more than 32 million. The lack of insurance is most common among those under age 45, who also make up a large majority of trauma patients.

Rises in unreimbursed trauma care costs have paralleled the increases in penetrating injuries associated with crime- and drug-related violence. In 1989, about 80 percent of gunshot and stabbing victims treated in some urban trauma centers were uninsured or eligible for medical care cost assistance under government programs (see p. 27).<sup>1</sup>

---

<sup>1</sup>This figure is based on 8 centers that were able to report such data.

---

When a trauma center closes, there is a “domino effect” as patients and accompanying financial losses are carried to centers that remain open. In four of the six urban areas GAO reviewed, the closing of several trauma centers increased the remaining centers’ caseloads of uninsured and government-assisted program beneficiaries, forcing some to close (see p. 28).

---

### Disruptions, Patients’ Concerns, and Physician Discontent Linked to Closures

Urgently needed trauma care disrupts hospital routines and physicians’ private practices and lifestyles, and upsets some private patients. Reportedly, these effects are serious enough to cause some trauma centers to close. Even centers that report financial losses as the primary reason for closing frequently report these effects as further influences on trauma center closure decisions (see ch. 3).

At 26 of 35 trauma centers GAO contacted, trauma care disrupted hospital routines and services, hospital officials said. Arriving unexpectedly in urgent need of treatment, trauma patients occupy operating rooms and the limited number of intensive care beds also available to nontrauma patients at some hospitals (see p. 30). Moreover, trauma injury victims often interrupt scheduled surgeries of nontrauma patients. When combined with negative social impacts of some gang and drug culture trauma patients, such as violence or drug activity in the trauma center, these disruptions raise concerns on the part of some hospital officials that paying patients may seek care elsewhere.

Trauma care negatively affected private physicians in most trauma centers, hospital officials reported. Surgeons dislike being on 24-hour call for trauma care. Physicians with private practices may have to delay seeing paying patients because they are treating trauma patients. Often, uninsured trauma patients and those covered by public programs pay little or none of their physicians’ costs for providing trauma care (see p. 33).

---

### Recommendations

GAO is making no recommendations.

# Contents

<b>Executive Summary</b>		2
<b>Chapter 1</b>		8
<b>Introduction</b>	Trauma System Concept Shown to Save Lives	8
	Federal Role in Trauma Care	16
	Objectives, Scope, and Methodology	18
<b>Chapter 2</b>		20
<b>Unreimbursed Costs</b>	Trauma Center Financial Losses Greater Than Expected	20
<b>Principal Cause of</b>	Losses Worsened by Deteriorating Payer Mix	26
<b>Uter</b>		
<b>Closures</b>		
<b>Chapter 3</b>		30
<b>Closures Also Linked</b>	Trauma Care Interrupts Hospital Services to Other	30
<b>to Disrupting Effects</b>	Patients	
<b>of Trauma Centers on</b>	Hospitals Concerned About Impact of Trauma on	31
<b>Hospitals and</b>	Nontrauma Patients	
<b>Physicians</b>	Trauma Viewed by Surgeons as Disruptive and a	33
	Financial Burden	
	Commitment to Provision of Trauma Care Is Key	35
	Ingredient	
<b>Chapter 4</b>		36
<b>Conclusions and</b>		
<b>Observations</b>		
<b>Appendixes</b>	Appendix I: Trauma Centers Included in GAO Review	38
	Appendix II: Medicaid Program Trauma Care Cost	40
	Reimbursement	
	Appendix III: Profits and Losses Reported by 35 Trauma	42
	Centers in Six Urban Areas	
	Appendix IV: Major Contributors to This Report	44
<b>Tables</b>	Table 3.1: Negative Effects of Trauma Care on Other	31
	Hospital Services Reported by 35 Trauma Centers	
	(1990)	



---

Table 3.2: Negative Effects of Trauma Care on Nontrauma Patients Reported by 35 Trauma Centers (1990)	32
Table 3.3: Negative Effects of Trauma Care on Physicians Reported by 35 Trauma Centers (1990)	35

---

## Figures

Figure 1.1: Trauma Center Team Works to Save the Life of Injured Trauma Victim	10
Figure 1.2: Emergency Rescue Team Transports Trauma Victim to Trauma Center	14
Figure 2.1: Motor Vehicle Crashes the Leading Causes of Trauma Injury Deaths	21
Figure 2.2: Prevalence of Penetrating Injuries in Inner- City Trauma Centers	22
Figure 2.3: Sources of Payment for 11 Trauma Centers (FY 1989)	25
Figure 2.4: Effects of Payer Mix on Trauma Center Revenues (FY 1989)	26
Figure 2.5: Weapons Used in Drug-Related Violence	28

---

## Abbreviations

ACEP	American College of Emergency Physicians
ACS	American College of Surgeons
CAT	computerized axial tomographic
DRG	diagnosis-related groups
DHHS	Department of Health and Human Services
EMS	emergency medical services
ICU	intensive care unit
MASH	mobil army surgical hospital
MTOS	Major Trauma Outcome Study
NHTSA	National Highway Traffic Safety Administration

# Introduction

Each year, more than 140,000 Americans die from injury. It is the leading cause of death for persons under age 45 and the fourth leading cause of death for all ages in the United States. Injury and death result from both unintentional events, such as motor vehicle crashes and falls, and deliberate events, such as assault and suicide. But prompt, definitive surgical treatment of severe or traumatic injury, available around the clock and facilitated through organized emergency medical services and hospital trauma care systems, can save lives and improve disability outcomes, as several studies have shown. A systematic approach to trauma care includes access to appropriate care, prehospital care, hospital care, and rehabilitation. Hospital care for the severely injured is provided in specialized hospital units known as trauma centers, the heart of a trauma system.

Despite their proven effectiveness, established trauma systems are in jeopardy as financial and other pressures force many trauma centers to withdraw from systems and close their doors to trauma patients. At least 60 trauma centers have closed over the last 5 to 6 years according to the Charles McC. Mathias, Jr., National Study Center for Trauma and Emergency Medical Systems. Currently, about 370 hospitals are designated as trauma centers.<sup>1</sup> Continued trauma center closures could cause some trauma systems to deteriorate and jeopardize the lives of many severely injured Americans.

Because of concern about trauma systems and future access to care for the severely injured, the Chairman of the Subcommittee on Health for Families and the Uninsured, Senate Committee on Finance, requested that we determine the extent of and reasons for trauma center closures. As many closures publicized in the media and health-related journals have occurred in major urban areas, we were asked to focus on centers in such areas where the problem seemed particularly acute. The problems faced by rural areas in establishing and maintaining access to trauma care are not addressed in this report.

## Trauma System Concept Shown to Save Lives

Regionalized trauma systems can greatly reduce the incidence of preventable deaths, studies have shown. Often, in areas where trauma care systems had not been developed, severely injured victims were taken to the nearest hospital instead of to a properly equipped trauma center. Many hospital emergency departments do not have the appropriate

<sup>1</sup>Howard R. Champion, M.D. and Marcia S. Mabey, Ph.D., "An American Crisis in Trauma Care Reimbursement," *Emergency Care Quarterly*, July 1990, pp. 65-87.

equipment and staff available on a 24-hour basis to treat life-threatening injuries. A health care system designed specifically for trauma care will reduce trauma deaths, the Committee on Trauma of the American College of Surgeons (ACS) asserts.

As applied in the United States, the trauma system concept evolved from the wartime experience of military doctors, who discovered that saving the lives of injured soldiers depended on speedy treatment and the availability of skilled surgical teams. Since civilian adaptation of the concept, various studies have shown that trauma systems can reduce the trauma death rate by as much as 64 percent. In one study, a team of physicians reported that specialized trauma care could have prevented 28 percent of deaths from head and spinal-related injuries and 73 percent of deaths from other injuries in a county where victims were transported to the nearest hospital.<sup>2</sup> In Washington, D.C., a 50-percent reduction in trauma deaths over 5 years has been credited to the development of a trauma care system.<sup>3</sup> In San Diego County, the trauma death rate fell by 55 percent the first year after implementation of a countywide trauma care system.<sup>4</sup>

---

<sup>2</sup>John G. West, M.D., et al., "Systems of Trauma Care: A Study of Two Counties," Archives of Surgery, Vol. 114, Apr. 1979, p. 460.

<sup>3</sup>U.S. Department of Transportation, The NHTSA Emergency Medical Services Program and Its Relationship to Highway Safety, Tech. Rept. DOT HS 806 832, Aug. 1985, p.5.

<sup>4</sup>San Diego County Division of Emergency Medical Services, The First Year Trauma System Assessment: County of San Diego, Aug. 1984-July 1985, Nov. 1985, synopsis and p. vii.

**Figure 1.1: Trauma Center Team Works  
to Save the Life of Injured Trauma Victim**



Source: Scripps Memorial Hospital, San Diego County, CA

---

## Emergency Care System Concept Evolved in Military

Stimulated by the pressing demands of war surgery and coupled with parallel advances in medical care, the trauma system concept was adopted early by the military. Rapid evacuation of the critically injured to adequately staffed and equipped advanced treatment units showed that a well-operated emergency medical system could save lives.

This was repeatedly demonstrated in military conflicts such as World War II and the Korean and Vietnam wars. During the Korean conflict, army doctors began bypassing first aid stations and taking injured soldiers directly from the field to mobile army surgical hospital (MASH) units. Expanding this concept in the Vietnam conflict, the military began using helicopters to transport badly injured soldiers straight to military surgical hospitals. There, trauma teams provided definitive surgical treatment within about an hour of the injury. Doctors call this the "golden hour" because it represents the approximate time frame in which lifesaving treatment is most successful. These advances in war-time military care, especially during the Vietnam War, prompted experienced military doctors to promote organized trauma systems in the United States. The close relationship between trauma and its military roots continues today, as some urban trauma centers serve as training grounds for military doctors.

---

## Trauma System Concept Adopted by States

During the late 1960s and early 1970s, the need for and conceptual design of a systems approach to improve delivery of civilian emergency care began to emerge in various states. The concept was that an organized health care system with special medical capabilities could improve chances of survival and recovery for patients at risk of dying from injury. Thus, regionalized systems of trauma care are organized to meet the health care needs of severely injured people. ACS and other trauma experts describe a well designed trauma system as having the following four key components:

1. Access to care involves identifying special rescue resources through contact devices, such as the 911 emergency telephone number, radio transmitters, and a dispatch location, as well as knowledge of how to communicate with the system.
2. Prehospital care focuses on the rapid transport of injury victims by emergency vehicle or helicopter. Paramedics and emergency technicians perform lifesaving first aid and transport victims to trauma centers.

3. Hospital care provides trauma patients with life-saving surgery and treatment through trauma centers with sophisticated equipment and highly trained staff. Trauma centers have immediate access to an operating room and surgical specialists available 24 hours a day.

4. Rehabilitative care involves restoring the injured patient to the most sound or healthy state possible. Both inpatient and outpatient care is often necessary for full recovery.

Currently, few states have regionalized trauma care systems but several states have initiated actions toward developing such systems. The American College of Emergency Physicians (ACEP) has developed guidelines for trauma care systems that incorporate components and providers in urban and rural settings. The guidelines are to assist regions in planning, implementing, operating, and evaluating new and existing systems.

---

## Trauma Centers Form the Heart of Trauma Systems

Central to a trauma system are the trauma centers that support it. Specialized facilities staffed by experienced surgeons and other trained health care personnel, trauma centers have priority access to sophisticated hospital equipment and services for treating severe injuries. They can provide the quality of care needed to prevent unnecessary death and disability. One feature that distinguishes trauma centers from most emergency rooms is the immediate availability of specialized services on a 24-hour basis—essential for trauma, which is frequently nocturnal with peak occurrences on weekends.

The American College of Surgeons has defined the trauma center resources necessary for optimal care and suggested the minimum number of patients that should be treated for optimal outcome. ACS standards call for specific life support and resuscitation equipment, intensive care units, operating suites, and laboratory services. A variety of surgical specialists should be available, as well as such nonsurgical specialists as anesthesiologists. A trauma center should treat a minimum of 350 trauma patients per year and each physician at least 50 patients annually to maintain proficiency, ACS says.

ACS guidelines classify trauma centers by levels of care:<sup>5</sup>

- Level I centers generally provide a community with immediately available, 24-hour care by in-hospital surgeons and other on-call physicians. Such centers are the primary hospitals in a trauma system and can provide total care for every aspect of injury. Hospitals with Level I trauma centers have a significant research and teaching commitment to residents in training and provide leadership in regional trauma system development.
- Level II centers should provide 24-hour care but may not offer the same sophistication as a Level I center. They may be community teaching hospitals but without the teaching, research, and community leadership commitment.
- Level III or rural trauma centers lack the resource requirements of Level I and II centers. They provide prompt assessment, resuscitation, and stabilization followed by surgical treatment, if resources are available, or interhospital transfer. There is little need for Level III trauma centers in urban areas. But they are valuable in sparsely populated rural or outer suburban communities, where it may be in the patient's interest to be evaluated before transfer to definitive care if needed.

---

## The Universe of Designated Trauma Centers

Not all states have formally designated trauma centers. Of the 6,640 hospitals in the United States, approximately 370 are designated or verified by a state or local entity and function as trauma centers.<sup>6</sup> Another 60 hospitals closed their trauma center operations within the last 5 to 6 years.

Generally, hospitals apply for designation or verification and are selected under criteria established by the specified state or local authority. Such criteria are not necessarily those of ACS, which if requested, will evaluate a facility and its staffing. For centers that meet ACS trauma center standards, ACS will provide certification. But, neither ACS nor ACEP is responsible for designating or selecting a particular hospital to be a trauma center. The selection or designation process varies in different areas and is sometimes political. Some entities determine how many centers are appropriate for the area, some do not. At times, the designating entity saturates an area with too many trauma centers.

---

<sup>5</sup>Champion and Mabec discuss ACS guidelines and the classification of trauma centers in more detail.

<sup>6</sup>Champion and Mabec.

Another important factor in trauma center designation is hospital location. The objective is to provide broad coverage of an area within an acceptable time frame, based on the golden hour concept. A designated trauma center is assigned a specific geographic area, called a "catchment area," which usually extends beyond the hospital's normal medical service area. The catchment area boundary is based primarily on the time it takes to transport an injured patient to the trauma center. In many trauma systems, the maximum time allowed is 20 minutes. ACS asserts that in most urban communities, transport to a trauma center should be accomplished within 30 minutes of the time emergency medical services systems are notified of a major trauma injury. Usually, local emergency medical services units will transport all trauma patients injured within a trauma center's catchment area to that facility.

**Figure 1.2: Emergency Rescue Team Transports Trauma Victim to Trauma Center**



Source: Scripps Memorial Hospital, San Diego County, CA

## Trauma Centers Can Be Expensive

In years past, some hospital administrators knew before applying that being designated a trauma center could be an expensive venture. However, they believed that the investment would pay off initially in indirect benefits such as greater visibility and prestige. Trauma center status enables hospitals to better attract professional staff and gain a reputation for critical care expertise. This, hospital officials hoped would lead eventually to more paying patients and increased revenue.



Furthermore, it gives some hospitals the opportunity to establish a first-rate residency program. But maintaining trauma center standards and providing trauma care to those who do not pay can be expensive, hospital officials have found. As some hospitals experience both greater financial losses than expected and staff discontent, they begin to question the value of such indirect benefits.

Patient charges for trauma care are high compared with those for other care because severely injured patients require intensive resources, personnel, and equipment. In 1988 dollars, the average charge per admission in a trauma center was about \$12,000 compared with \$4,130 per admission in a hospital for regular acute care. Of the estimated \$12.4 billion that initial hospitalization for injury in the United States cost in 1988, trauma or severe injury accounted for \$5.95 billion.<sup>7</sup> Furthermore, many inner-city trauma patients are among either the more than 30 million Americans who lack private health insurance or those eligible for Medicaid and other state and local government programs<sup>8</sup> that may not adequately reimburse the high cost of trauma care.

---

## Injury Prevention Reduces Need for Expensive Treatment

Like treating trauma injuries, preventing them is also important. The need to emphasize prevention is highlighted by the premature deaths, disabilities, and costs (including large public sector expenditures) resulting from injury. During the past three decades, fatalities and injuries, most notably from motor vehicle crashes, have been reduced. But as other types of trauma injuries, such as those from firearms and knives, increase and the costs of treating severe injury soar, efforts to further reduce the incidence of trauma could prove beneficial.

Injury prevention consists of interventions to eliminate or reduce the likelihood of injury. Three general strategies to prevent injuries are cited, in order of effectiveness, in a National Academy of Sciences report of injury in America<sup>9</sup>:

---

<sup>7</sup>Champion and Mabee.

<sup>8</sup>Programs that partially reimburse trauma care costs for eligible individuals are referred to as "government-assisted" programs throughout this report. These include most state Medicaid programs and state and local programs like Florida's immigration assistance program or Michigan's Wayne County CountyCare program, which provide some assistance to people in need.

<sup>9</sup>The National Academy of Science, Injury In America: A Continuing Public Health Problems, 1985, pp. 7 and 37.

1. Provide automatic protection by product and environmental design, such as installation of automatic seatbelts and air bags in automobiles;
2. Require by law individual behavior change, such as use of seatbelts and motorcycle helmets; and
3. Persuade persons at risk of injury to alter their behavior, such as motivating people to avoid driving drunk and associating with street gangs or illegal drug activity.

These strategies can be applied in the prevention of all types of trauma injuries. Their effectiveness varies inversely with the extra effort required to keep people from being harmed and the degree to which people must change usual behavior patterns. But, more research is needed, the Academy says, to identify the most effective strategies for reducing injuries and their costs.

---

## Federal Role in Trauma Care

The federal government first assumed a leadership role in improving emergency medical services (including trauma) through categorical grant programs created under the 1966 Highway Safety Act and the 1973 Emergency Medical Services (EMS) Systems Act.

In the early 1980s, the federal government devolved much of its leadership responsibilities to states by folding the EMS Systems Act program into the Preventive Health and Health Services block grant. States now could decide how much funding would be made available for EMS under the block grants. In our 1986 report,<sup>10</sup> we concluded that some funding successes for prehospital EMS had been achieved but that states were slow to act on the development of regional trauma systems.

In the mid-1980s, the Congress approved legislation<sup>11</sup> giving the public virtually uncontested access to emergency care services. The federal government requires that hospitals participating in the Medicare program and equipped to do so, treat all people who come to the facility needing emergency care. Yet, federal reimbursement to hospital emergency rooms and trauma centers for the care of these individuals is limited largely to care for patients who qualify for such federal public health programs as Medicaid and Medicare. Considerable publicity and

---

<sup>10</sup>Health Care: States Assume Leadership Role in Providing Emergency Medical Services (GAO/HRD-86-132, Sept. 30, 1986).

<sup>11</sup>The Consolidated Omnibus Budget Reconciliation Act of 1985 (P. L. 99-272).

debate is focused on unreimbursed costs related to trauma care for the uninsured and some government-assisted program participants, and their impact on trauma center closures.

Federal involvement, specifically in the establishment and financing of trauma care systems, and to a limited extent, trauma care costs, was authorized by the Congress in 1990.<sup>12</sup> The legislation aims to help state governments develop, implement, and improve regional trauma care systems. It authorizes \$60 million dollars for fiscal year 1991 and "such sums as may be necessary" for fiscal years 1992 and 1993. Individual grants to states will be no less than \$250,000 annually and to U.S. territories, no less than \$50,000. To receive federal funding, a state must

1. develop a trauma care plan that takes into account national standards for the designation of trauma centers and for patient triage, transfer, and transportation policies;
2. provide at least one dollar in matching nonfederal contributions (in cash or in kind) for each federal dollar received during the second fiscal year and three dollars for each federal dollar received for any subsequent year; and
3. restrict use of the federal allotment to developing, implementing, and monitoring required trauma care modifications to its emergency medical services state plan. A state may reimburse designated trauma centers for unreimbursed costs with a percentage of the allotment but only if it so requests and is granted a waiver by the Secretary of Health and Human Services. To receive a waiver, a state must demonstrate that its trauma care system meets the model requirements and represents the highest quality of trauma care. Also, rural areas of the state must have basic elements of an EMS system, such as the 911 emergency telephone number, as required by the act.

Helping states and communities learn about establishing trauma care systems is the goal of an initiative by the National Highway Traffic Safety Administration (NHTSA). An agency of the Department of Transportation, NHTSA has developed a state and community guide to establishing trauma systems. At the request of state officials, NHTSA will organize teams of experts to provide training in trauma system development and evaluate existing trauma systems.

---

<sup>12</sup>The Trauma Care Systems Planning and Development Act of 1990 (P.L. 101-590), signed into law Nov. 16, 1990.

---

## Objectives, Scope, and Methodology

The Chairman of the Subcommittee on Health for Families and the Uninsured, Senate Committee on Finance, asked GAO to review the impact of trauma care cost reimbursement on the availability of trauma care in urban areas. In subsequent discussions with his office, we agreed to focus on the extent of and reasons for urban trauma center closures. Accounts of trauma center closures relating to unreimbursed costs were more prevalent in urban areas than rural, although it has been reported that the provision of rural trauma care is problematic.

We interviewed hospital officials from both open and closed trauma centers in six major urban areas. Using a pro forma data collection instrument, we gathered detailed financial and injury incidence data. Also, we interviewed or obtained information from representatives of the American College of Surgeons, the American Hospital Association, the American Trauma Society, and the Department of Transportation. Others with whom we talked were officials from the Charles McC. Mathias, Jr., National Study Center for Trauma and Emergency Care Systems and local EMS systems. Finally, we extensively researched the literature on trauma centers and trauma systems.

In the six urban areas we selected for review, there were several trauma center closures or the threat of such closures in four—Chicago, Miami, Los Angeles, and Washington, D.C.<sup>13</sup> Of the remaining two, San Diego County's trauma system is considered to be a model regional trauma system and Detroit lacks an established trauma system. Instead, Detroit has an informal agreement among four hospitals to provide trauma care.

Within the six areas, we selected 35 hospital trauma centers (see app. I) for review of their trauma care experience. Of the 35 centers, 20 were open and 15 had closed as of 1990. Our choice of hospitals was based primarily on their initial indication that computerized trauma center data were available. Although the 35 hospitals do not constitute a representative sample of trauma centers nationwide, they include about 25 percent of the estimated 60 closed trauma centers across the nation.

To determine the 35 centers' caseload and reimbursement experience, we requested statistics on their trauma injury incidence and financial data (including charges, costs, reimbursement, and source of payment).

---

<sup>13</sup>Closed trauma centers, as discussed in this report, are hospitals that have withdrawn from participation in area trauma systems and no longer routinely provide trauma care services to severely injured people.

Documentation of trauma center costs, losses, and patients was inconsistent among hospitals and generally inadequate for the purpose of our analyses. Some centers could not furnish detailed data, and not all data hospitals provided were complete. In some cases where documented evidence of financial experience was unavailable, we used information that hospital officials reported as their best estimates.

Of the 35 hospitals, 11 provided enough trauma financial data for our analysis of 1989 costs, charges, and reimbursement. Another four gave us partial data. The remaining 20 hospitals provided little or no detailed financial data. Officials at most of these trauma centers said they did not provide the data we requested because they

- did not retain documented records of past years' financial experience as a trauma center,
- lacked the resources to compile the data, or
- could not separate their trauma data from other services they provide because of the design of their recordkeeping system.

Of the 35 hospitals, 31 gave us estimates of profits and losses specifically related to trauma care.

We did not independently verify the accuracy of data provided by the hospitals. While we requested trauma center-specific information, the extent to which the financial data reflect actual trauma center costs, reimbursement, and losses depends on the accuracy of provider reporting. We checked the data for completeness, consistency, and mathematical errors.

Our work was performed between October 1989 and September 1990 in accordance with generally accepted government auditing standards.

# Unreimbursed Costs Principal Cause of Urban Trauma Center Closures

Many urban area trauma centers report losing millions of dollars on care they provided uninsured patients and others covered by government-assisted programs. At individual trauma centers in the six urban areas we reviewed, annual losses ranged from about \$100,000 to more than \$7 million. The losses, hospital officials contend, are caused by their inability to recover costs for treating trauma patients who lack private health insurance or whose coverage is provided through public programs such as Medicaid in some states (see app. II) and other government-assisted programs. The level of unreimbursed costs is driven by the high cost of treating trauma coupled with a disproportionate caseload of low-paying and/or nonpaying patients. Such patients are particularly likely in inner-city areas where poverty is prevalent and drug/crime-related injuries have increased.

Financial losses from providing trauma care are the principal cause of trauma center closures. Since the mid-1980s, 22 trauma centers in the six cities in our review (Chicago, Detroit, Los Angeles, Miami, San Diego, and Washington, D.C.) closed their doors. Of the 22 closed centers, 15 are included in the 35 centers we reviewed. Some closures may have reflected an oversupply of trauma centers and had no major adverse impact on access to trauma care because a sufficient number of trauma centers remained opened. In some communities, however, the closure of additional trauma centers poses a potential problem of access to trauma care.

## Trauma Center Financial Losses Greater Than Expected

Most hospital officials expected to lose money initially on trauma care, but many did not expect the level of losses their trauma centers incurred. Of the 31 trauma centers<sup>1</sup> that gave us profit-and-loss figures, 28 reported losses totaling \$65.5 million during their most recent year of operation (see app. III). Two centers reported a profit, and the remaining one broke even. Closed trauma center losses ranged from \$100,000 to \$5.3 million, and open centers lost from \$500,000 to more than \$7 million.

The decision to close a trauma center is based primarily on the level of losses the hospital is willing to absorb, according to officials at the majority of the centers reporting losses. Of the 15 closed centers, 12 withdrew from participating in trauma care systems primarily because of the financial losses they incurred. At most of the trauma centers that

<sup>1</sup>Of the 35 trauma centers we contacted, 4 could not determine whether they had a profit or loss on trauma care because their trauma financial data could not be separated from other hospital data.

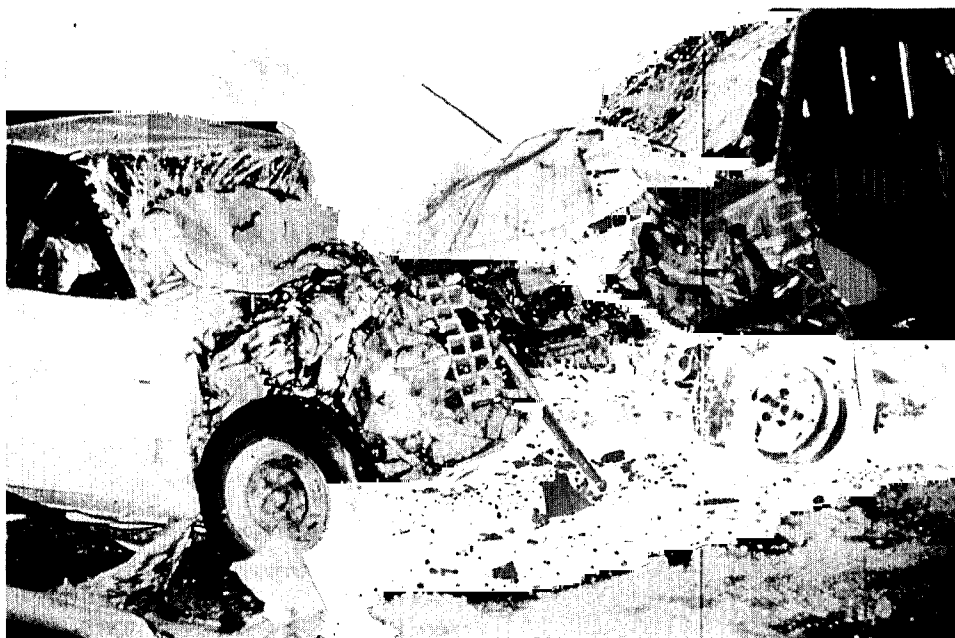
remain open but are losing money, officials said they may be unable to remain in trauma systems if the losses continue or increase.

Not all closed trauma centers would seek to reenter their trauma system if adequate funding were provided. However, six of the closed centers would do so, officials indicated, if some level of government would fund trauma care. At one of the six, officials said malpractice insurance premiums also would have to be reduced before they rejoined.

### Urban Trauma Center Case Mix Influences Losses

Trauma centers' financial well-being is related to their location and the type of injuries they treat. The major categories of trauma injuries are blunt (caused by blunt force objects), penetrating (caused by piercing objects), and other (which includes burns and near drownings). The primary causes or mechanisms of blunt trauma are motor vehicle crashes and falls; of penetrating trauma, gunshots and stabbings. Generally, the percentage of blunt trauma injuries is much greater than that of penetrating injuries, according to the ACS' Major Trauma Outcome Study (MTOS). The MTOS multistate database is considered the largest comprehensive representation of trauma patient outcomes from 1982 through 1989 in urban, suburban, and rural areas.

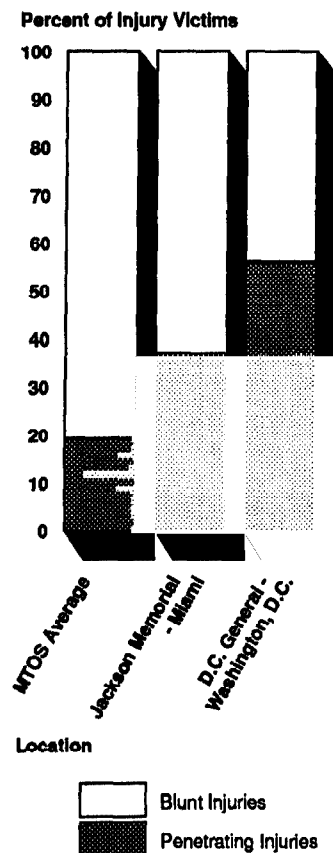
**Figure 2.1: Motor Vehicle Crashes the  
Leading Causes of Trauma Injury Deaths**



Source: Scripps Memorial Hospital, San Diego County, CA

But in many major urban areas, penetrating injuries constitute a much larger percentage of total trauma cases. In 1989, penetrating injuries averaged 31 percent of trauma cases treated at the urban trauma centers that gave us this data, compared with the 1988 MTOS average of 19 percent. A look at individual inner-city trauma centers shows even greater disparity in penetrating and blunt trauma injuries. Penetrating injuries made up 37 and 56 percent respectively of the trauma caseloads at two inner-city trauma centers in 1989, as figure 2.2 shows. These percentages were much greater than the 1988 MTOS average. The larger the proportion of penetrating injuries a trauma center treats, the greater its likelihood of losses.

Figure 2.2: Prevalence of Penetrating Injuries in Inner-City Trauma Centers



Note: Hospital data are for 1989, MTOS data are for 1988.



The higher proportion of penetrating injuries at some inner-city trauma centers and their negative impact on reimbursement are due primarily to the environment in which the centers operate. Inner-city hospitals see more gun and knife injuries, and many of their patients are uninsured or qualify for government-assisted programs. In suburban and rural areas, where most injuries involve automobile accidents, victims are more likely to be covered by insurance. The contrast in the make-up of trauma injury populations in major inner-city areas and the nation exemplifies the adverse impact of these factors on urban area trauma center reimbursement.

---

### **Trauma Center Profitability Linked to Payer Mix**

The insurance status of patients treated, or payer mix, clearly influences the profitability of trauma centers. Whether patients have private health insurance coverage or publicly provided insurance or are uninsured is a key determinant of a center's financial viability. Hospitals that can control their payer mix or increase the level of payments from payers that do not reimburse trauma care costs can ensure their trauma centers a healthier financial position.

However, trauma centers must treat severely injured persons regardless of their source of payment. Like emergency departments, trauma centers have little authority to control their payer mix and to limit losses by accepting patients according to ability to pay. Effective August 1986, any hospital participating in the federal Medicare program and receiving Medicare funds must provide for the examination of any patient, including non-Medicare patients, coming to the hospital's emergency department. This is a provision of the Consolidated Omnibus Budget Reconciliation Act of 1985 (P.L. 99-272). Under emergency medical conditions, the hospital must, given the staff and facilities available to it, provide the medical examination and treatment required to stabilize the patient. In essence, the law requires emergency departments and trauma centers to treat uninsured and underinsured patients but does not ensure them full compensation for the costs of their care.

The form of patients' health care coverage, if any, is a key determinant of reimbursement for their trauma care costs. Patients covered by private health insurance generate insurance payments that often fully reimburse trauma centers and in many cases exceed the costs of care. From uninsured patients, however, trauma centers receive only a fraction of the costs of their care. Trauma patients covered by Medicaid in some states, and other government-assisted programs generate somewhat higher reimbursements but the payments still do not fully cover

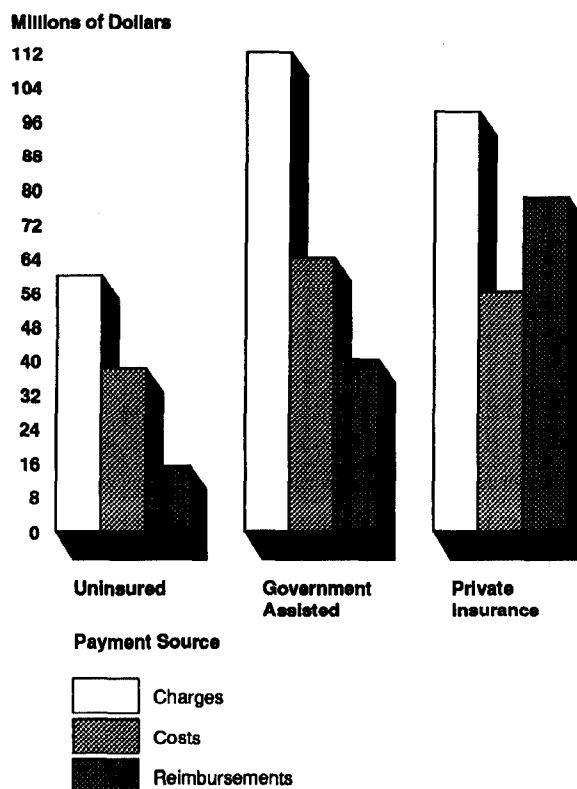
the costs of their care. A poor payer mix—too many uninsured and government-assisted program patients in a trauma center's caseload—negatively impacts the center's reimbursement.

Generally, trauma centers having a poor payer mix find it difficult to recover costs (see fig. 2.3). In the 11 hospitals that gave us detailed financial data for 1989,<sup>2</sup> uninsured patients generated \$38 million in costs. But these hospitals got back less than 40 cents per dollar of costs incurred or about \$15 million. This \$23 million loss on uninsured patients was neither the only nor the largest source of financial losses. Patients covered by Medicaid and other government-assisted programs generated costs that exceeded reimbursements by \$24 million.

---

<sup>2</sup>The majority of the trauma centers that provided detailed financial data reported information based on their experience in 1989. For trauma centers that closed prior to 1989, however, we used data from their last year of operation.

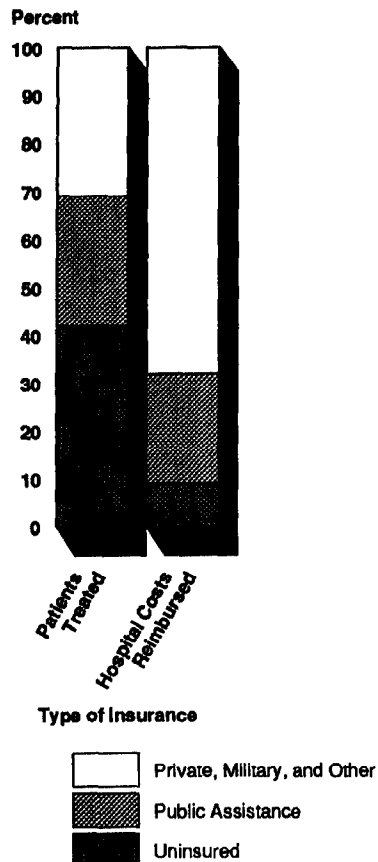
**Figure 2.3: Sources of Payment for 11 Trauma Centers (FY 1989)**



Note: Data presented are an average of 11 trauma centers' financial data. The government-assisted category includes financial data for Medicare trauma patients. Medicare data were insignificant and did not distort the effect of government-assisted programs' costs and reimbursement.

On the other hand, privately insured patients in the 11 trauma centers generated revenues that far exceeded the costs of providing trauma services. Indeed, payments by private insurers could be viewed as subsidizing the costs of providing care to the uninsured and those covered by government-assisted programs. However, the \$22 million by which private insurance revenues exceeded costs fell short of covering the combined shortfall of \$47 million from serving the uninsured and those covered by government-assisted programs. Although privately insured patients accounted for less than a third of all patients (see fig. 2.4) they generated over two-thirds of the centers' revenues. In sharp contrast, the uninsured comprised over 40 percent of the caseload but yielded less than 10 percent of revenues.

**Figure 2.4: Effects of Payer Mix on Trauma Center Revenues (FY 1989)**



## Losses Worsened by Deteriorating Payer Mix

As their payer mix deteriorates, trauma centers' financial losses escalate. Payer mix decline occurs when changes in a trauma center's caseload result in an increase in uninsured and government-assisted program patients. Of the 35 centers we contacted, 15 experienced caseload shifts that negatively affected their payer mix. The changes stemmed primarily from (1) increases in the size of the uninsured population, (2) increases in domestic and drug/crime-related violence, and (3) treating patients from areas formerly serviced by closed trauma centers.

## Growth in Uninsured Population Increases Trauma Center Losses

The growing uninsured population whose care is not paid for is a factor in the growth of trauma center losses. From the first quarter of 1977 to 1988, the number of uninsured in the United States under age 65 increased from about 26 million to more than 32 million. Furthermore, the lack of insurance is most common among younger adults (those

under age 45), who make up the vast majority of trauma patients. The problems become more pronounced in inner-city trauma centers that serve areas with a disproportionate share of lower income residents, who are also less likely to have health insurance. The trauma centers contend that they have a diminishing base of fully insured patients available to help subsidize care for the growing uninsured patient base.

---

## Increased Violence Adds to Trauma Center Losses

Inner-city trauma centers are victims of violent crime and drug wars because they have to treat those severely injured who often are uninsured and do not pay their bills. Many urban trauma centers reported increases in trauma cases related to the wave of violence that swept many inner-city communities during the 1980s. Most of the crime victims suffered penetrating injuries, such as gunshot and stab wounds. Not only do penetrating trauma victims consume a large amount of resources but the majority of them lack health insurance. At the eight privately-owned hospitals that gave us detailed trauma center data, 52 percent of penetrating injury patients treated were uninsured (compared with 35 percent of blunt injury patients).<sup>3</sup> Another 26 percent were covered by government-assisted programs that did not fully reimburse trauma care costs.

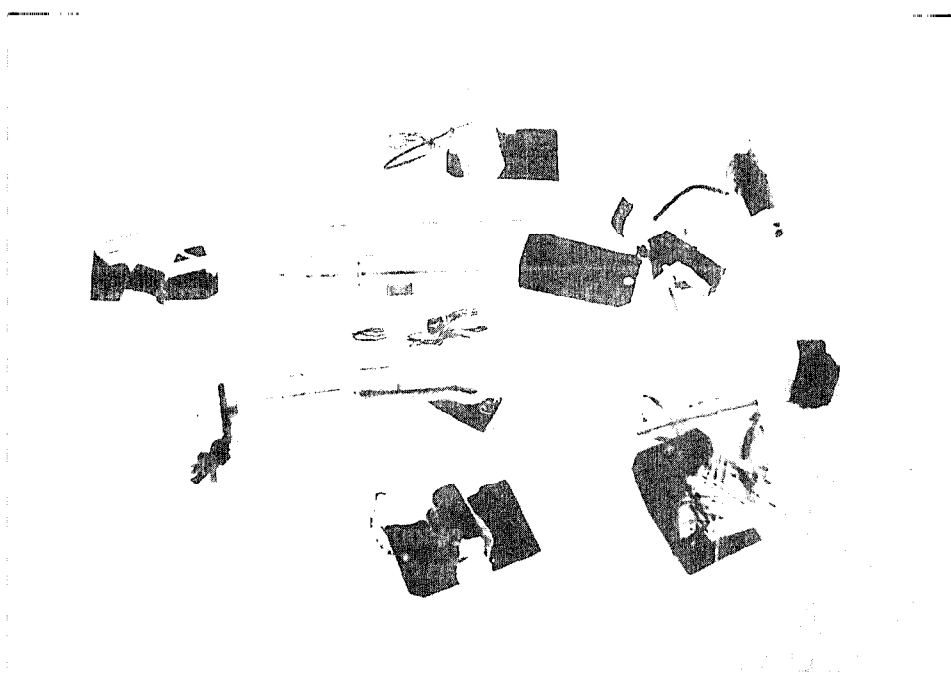
At one Washington, D.C., trauma center the number of violent injuries had jumped 94 percent since 1987. In 1988, the center's gunshot caseload increased 204 percent and stabbings rose 54 percent. Another hospital, not included in our review, reported a 33-percent increase in gunshot and stab wound cases from 1987 to 1989. Most were the result of drug- and gang-related violence. In Chicago, a trauma center reported that 52 percent of its trauma patients had penetrating injuries; 79 percent of these were uninsured and 13 percent were covered by government-assisted programs.

Not only has the number of penetrating injuries increased but the intensity of gunshot injuries has changed because of the increased use of semiautomatic weapons (see fig. 2.5). For example, Chicago's Cook County Hospital reported that in 1984 only 5 percent of patients admitted for gunshot wounds had been shot more than once. By 1988, however, that proportion had risen to 20 percent.

---

<sup>3</sup>At the two public hospitals that gave us detailed trauma center data, 62 percent of penetrating injury patients treated were uninsured. These public hospital centers also treated a much higher share of uninsured blunt injury patients (59 percent).

Figure 2.5: Weapons Used in Drug-Related Violence



Source: Department of the Treasury, Bureau of Alcohol, Tobacco and Firearms

### Domino Effect Increases Losses for Open Centers

An area trauma system can deteriorate when some of its trauma centers close, overburdening others. When trauma centers withdraw from established trauma systems, the patients who normally would be seen at those closed facilities must be taken to other open trauma centers, usually the next closest in the system. The closed centers' uninsured and government-assisted program patients also are inherited by the centers receiving the additional caseload. Some such centers close, unwilling to absorb the additional volume and financial losses. Their closure puts additional pressure on the next closest centers in the trauma system. If continued, the domino effect can deteriorate trauma systems to the point of failure. It is particularly destructive to trauma systems that have a small number of trauma centers.

In four of the six areas GAO reviewed, closures of some trauma centers and their withdrawal from trauma systems resulted in this domino effect. Officials of the remaining centers said their caseloads of uninsured and government-assisted program patients increased following the closures. The effect was, for example, apparent in Chicago. After the University of Chicago Hospital trauma center closed, the trauma patient caseload at Michael Reese Hospital increased by more than 50 percent.

Most of the increased caseload was either uninsured or government-assisted program patients. The higher level of unreimbursed costs associated with the expanded caseload was a major factor in Michael Reese Hospital officials' decision to withdraw from the Chicago trauma system in 1990. Nearby Christ Hospital in Chicago, whose trauma center remains open, reported a 71-percent increase in its trauma caseload between 1988 and 1989. This was due in large measure to the patient caseload transferred from the closed centers. The expanded caseload resulted in an 88-percent increase in the hospital's government-assisted program caseload and an even larger increase of 90 percent in its uninsured caseload.

# Closures Also Linked to Disrupting Effects of Trauma Centers on Hospitals and Physicians

While financial loss is the principal reason most urban hospitals decide to close their trauma centers, disruptions in hospital services, concerns about losing paying patients, physicians' reluctance to providing trauma care, and low physician reimbursement are additional factors contributing to closures. In some cases, hospital officials reported that these factors were even more important than financial losses in their decision to close their trauma center.

Of the 35 trauma centers we studied, officials at 33 reported that they experienced several negative effects from treating trauma patients. Three centers closed because of them. While the primary reason for closing at the other 12 closed centers was financial, hospital officials told us that negative effects of trauma also influenced their closure decision to some degree.

The effects of being a trauma center are not new to some hospitals, as many were providing trauma care in their communities before designation or the development of trauma care systems. As previously mentioned, many hospital officials believed the indirect benefits of trauma center designation outweighed some of its negative effects. But recent research on trauma centers is beginning to recognize the disruptive impacts on hospitals and physicians of providing trauma care.<sup>1</sup> Growth in the uninsured population and increased inner-city violence have added stresses to many centers in trauma systems. Some hospitals that sought designation may have had a low tolerance for the demands of urban area trauma or did not anticipate the impact of its effects, including negative reaction from their physician staff. Even though the demands of trauma can be great, an important factor for trauma center designation is hospital and physician commitment to the provision of trauma care, ACS and others assert.

## Trauma Care Interrupts Hospital Services to Other Patients

Due to the nature of their injuries, trauma patients require immediate treatment and hospital services. Providing such care disrupts hospital routines in that it requires rescheduling of surgeries and X-ray services and causes shortages of available intensive care unit (ICU) beds for other patients. Of the 35 trauma centers we reviewed, 26 found that trauma care interrupted hospital services and routines, hospital officials told us.

<sup>1</sup>Florida Health Care Cost Containment Board, *Trauma Care Costs in Florida*, in cooperation with the Center for Human Services Policy and Administration, Florida State University, and Florida Department of Health and Rehabilitative Services, Office of Emergency Medical Services, Feb. 1989, p. III.20. Also, unpublished survey results of the Charles McC. Mathias, Jr., National Study Center for Trauma and Emergency Medical Systems.



Most hospitals' trauma centers and emergency departments share equipment, operating rooms, and ICU beds. But because trauma patients require immediate treatment, they get priority use of hospital resources. When trauma demands are heavy, they disrupt routine hospital operations, causing staff to reschedule computerized axial tomographic (CAT) scan and X-ray appointments and elective and other nontrauma surgeries that require ICU beds. The unavailability of staffed ICU beds for nontrauma and sometimes trauma patients was a major concern of many hospitals.

Many hospital officials commented about having to reschedule operations for elective surgery patients and making nontrauma emergency patients wait for service. At one hospital, surgeries, including 15 colon surgeries, were postponed for up to 3 weeks because of trauma disruptions. Another hospital frequently closed its emergency room to nontrauma patients, a hospital official said, because trauma patients were utilizing all ICU beds. Nearly three-quarters of the 35 hospitals we contacted reported some type of negative impact on other hospital services caused by their trauma center operation. Most frequently mentioned were disruptions in scheduled surgeries and shortages of ICU beds (see table 3.1).

**Table 3.1: Negative Effects of Trauma Care on Other Hospital Services Reported by 35 Trauma Centers (1990)**

Negative effect	Percent of centers
Disrupts scheduled surgeries	49
Causes shortages of ICU beds	46
Disrupts scheduled CAT scan/X-ray use	17
Other	23
None	26

## Hospitals Concerned About Impact of Trauma on Nontrauma Patients

The effect of trauma patients on nontrauma patients and the potential financial impact on the hospital is another concern of some hospital officials. Nontrauma patients may react negatively in various ways to disruptions caused by trauma patients and the care they require. Some nontrauma patients are frustrated by the resulting delays in services, including rescheduling of tests and surgeries. Or they may feel uneasy in a perceived hostile environment or frightened by trauma patients involved in crime- or drug-related violence. In addition to being concerned about patients' well-being under such conditions, some hospital officials fear that paying patients who react negatively to the trauma

care environment will seek services elsewhere, causing the hospital to lose revenue.

At one hospital, discharged nontrauma patients criticized orally and in writing the quality of service and treatment they received, according to hospital officials. Of the 35 trauma centers reviewed, 21 reported negative effects of trauma on nontrauma patients (see table 3.2). Disruption of scheduled surgeries and tests and delay in treatment or long waits for ICU beds were the most frequent complaints. Patients' fears of violence and discomfort with the hospital environment were more sporadically reported, although they were often an important factor in individual hospital decisions on discontinuing trauma care. Officials at more than a third (37 percent) of the trauma centers, however, did not feel that nontrauma patients were adversely impacted by the demands of trauma care.

**Table 3.2: Negative Effects of Trauma Care on Nontrauma Patients Reported by 35 Trauma Centers (1990)**

Negative effect	Percent of centers
Patient schedules disrupted	23
Delay in treatment or long waits for ICU beds	23
Fear of violence from visitors of trauma patients	17
Uncomfortable with socioeconomic environment of trauma patients	9
None	37
Unknown	3

Generally, concerns about negative social impacts involved trauma patients who were injured through involvement in gang- or drug-related violence. In some cases, there were attempts to continue the violent attacks in the trauma center, hospital officials said. Nontrauma patients expressed displeasure at the noise, offensive language, and discourteous behavior exhibited by some trauma patients and their visitors. The number of private paying patients treated at one facility dropped significantly, officials noted, after an alleged drug dealer injured in an attack was later killed in his hospital bed while recuperating from surgery. At another hospital, it was not uncommon to give false names to trauma patients injured in gang wars to prevent rival gang members from seeking them out.

Several trauma centers increased security measures to ensure the safety of their patients and staff, we learned. Such measures included hiring more security guards, installing metal detectors, and locking the emergency department doors after dark. Security personnel at one hospital

routinely confiscated weapons from visitors of trauma patients. A hospital that closed its trauma center had found visitors of some trauma patients openly selling drugs in the corridors, according to the hospital president.

---

## Trauma Viewed by Surgeons as Disruptive and a Financial Burden

Trauma care negatively affects trauma physicians, officials at 26 of 35 trauma centers told us, and some surgeons are reluctant to treat trauma victims. Such patients often cause disruption to the private practice and personal/social life of surgeons, who may receive little or no reimbursement for the care they provide. In some areas, surgeons complain about the high malpractice insurance premiums they must pay because of the perceived higher risk of litigation from trauma cases. Some hospitals are finding it increasingly difficult to attract and retain qualified surgeons because of the effects of trauma care on physicians' income and lifestyle.

Many surgeons dislike the ACS guideline for Level I and II trauma centers requiring that certain specialists be on the premises or readily available at all times. These trauma centers must have a trauma surgeon and an anesthesiologist in-house 24 hours a day. Moreover, there must be a neurosurgeon and an orthopedic surgeon on call at all times. Surgeons at 11 of the 35 centers we studied disliked this. Because trauma injuries occur mostly at night, working late at night and being on 24-hour call is disruptive to some surgeons' lifestyles and can result in their earning less income from elective surgeries and office care. For example, if a neurosurgeon is called in for trauma surgery the night before a scheduled elective surgery it is unlikely the surgeon will take the elective case the next day, so he/she forgoes income. Moreover, as discussed below, the services the surgeon provides in the trauma center often are not paid for, thereby compounding the loss of income.

Another negative factor for some trauma center physicians is the little or no reimbursement for their services to uninsured trauma patients and those covered by government-assisted programs. Such patients often require a greater time commitment than do elective cases. For example, orthopedic surgeons often provide follow-up care for months and even years, to some of their patients. By taking trauma cases, they could end up providing costly free service for a long time. A Washington, D.C., trauma surgeon said that he and surgeons on his five-member team each provides more than \$100,000 worth of free care a year to gunshot patients alone.

Some physicians are also disturbed by malpractice concerns that stem from care to trauma patients. Conditions relating to malpractice litigation consume time and add to the financial burden of providing trauma care. While we found no definitive data linking trauma care to higher malpractice premiums, some emergency care physicians believe they are at greater risk of malpractice lawsuits. This did not seem to be a major concern in many trauma centers, but trauma surgeons in the Dade County, Florida, area, for example, complained about their insurability and the excessively high insurance rates they pay to obtain coverage.

Public and some teaching hospitals have developed mechanisms to address some of the physician-related trauma cost concerns. For example, sovereign immunity from malpractice claims is available for some public hospital physicians. Public and teaching hospitals also use salaried staff or resident interns to provide trauma care. Sometimes, hospitals will pay stipends to neurosurgeons, orthopedic surgeons, and anesthesiologists who are on call or guarantee physicians a percentage of their charges. However, these arrangements are negotiated on an individual basis.

In a recent survey<sup>2</sup> of the Washington State American College of Surgeons' membership, 39 percent of 490 respondents said they would prefer to treat no trauma patients. These surgeons, who were more likely to be practicing in urban areas, felt that trauma care has a negative impact on elective practice. They agreed that trauma patients require a greater time commitment but do not reimburse at the same level as nontrauma patients. The survey concluded that surgeons have a generally negative attitude toward care of trauma patients.

Inadequate reimbursement and dislike for being on 24-hour call were mentioned most frequently as reasons that surgeons at the 35 trauma centers we visited were reluctant to treat trauma (see table 3.3). Officials at five trauma centers we contacted said they had problems with maintaining staffing levels for at least one surgical specialty area.

---

<sup>2</sup>Thomas J. Esposito, M.D., Ronald V. Maier, M.D., Frederick P. Rivara, M.D., M.P.H., and James Car-  
rico, M.D., "Why Surgeons Prefer Not to Care for Trauma Patients," Archives of Surgery, Vol. 126,  
Mar. 1991, pp. 292-297.

**Table 3.3: Negative Effects of Trauma Care on Physicians Reported by 35 Trauma Centers (1990)**

Negative effect	Percent of centers
Inadequate/no reimbursement	34
Being on 24-hour call	31
Malpractice concerns	17
Fear of law suits by trauma patients	17
Loss of paying patients	7
Other	23
None	26

## Commitment to Provision of Trauma Care Is Key Ingredient

The most significant ingredient for optimal care of the trauma patient is institutional and personal commitment, ACS' Committee on Trauma reports. Optimal care means the hospital should have available a sufficient number of capable personnel, as well as sophisticated equipment and services, even though the latter are often expensive to purchase and maintain. Also, there must be priority access to laboratory and radiological facilities, operating rooms, and ICUs. The hospital's mission statement should clearly articulate its commitment to the community and specifically to the needs of the patient. The heaviest burden of commitment falls on the surgical staff, ACS states. Availability, training, and dedication to high performance in trauma care are measures of surgical staff commitment.

Experts have spoken out on the importance of trauma centers having surgeons committed to trauma care. For example, some trauma specialists believe that several trauma center closures in the Los Angeles and Dade county areas may not have been as much of an uncompensated care problem as proclaimed. Instead, the closings were influenced by medical staff indifference to trauma care. Most of the hospitals sought designation because administrators saw trauma care as an asset to the institution. They were doomed to fail because they lacked the willing support from their medical staffs. These and other trauma experts emphasize that trauma care can be successful only if it is provided by a highly committed medical staff willing to accept the fundamental limitations of treating some trauma patients.

# Conclusions and Observations

Many urban trauma centers have withdrawn from organized trauma systems and closed their doors to severely injured people who would have been routed to the center for trauma care. Their primary reason for closing, officials at most hospitals said, was financial loss from treating uninsured trauma patients and those covered by government-assisted programs. However, disruptions in other hospital services, concerns about losing paying patients, and changes in physician staff attitudes about providing trauma care were other factors driving decisions to close. While all trauma center closures may not have an adverse impact on access to trauma care, in some communities continued deterioration of trauma systems could pose an access problem.

Some trauma centers remaining open continue to face financial burdens of unreimbursed trauma care costs. Inner-city trauma centers are particularly hard hit. Because of increasing urban violence and drug abuse, they are treating a growing number of knife and gunshot victims who are generally uninsured or covered by government-assisted programs that often do not pay fully the high costs of trauma care.

Under federal law, Medicare-participating hospitals must treat and at least stabilize all patients entering their trauma centers or emergency departments who require emergency care. Because of the high cost of treating severe trauma and the large share of inner-city patients unable to pay such costs, urban trauma centers are being asked to take on a large financial burden to address this mandate. The financial demands on these centers are great. Policymakers are beginning to focus on the need for and level of compensation for unreimbursed hospital and physician trauma care costs.

The federal government has taken a leadership role in developing effective regional trauma systems. The recently passed Trauma Care Systems Planning and Development Act of 1990 provides the impetus for national trauma system development at the state level. In addition to authorizing federal grants for trauma system development, the act permits states to apply for a waiver to use a portion of the funds for uncompensated trauma care costs. The Secretary of Health and Human Services and states are charged with implementing the act. As they do so, placing emphasis on establishing sound criteria for designating trauma centers and distributing whatever funds are made available for uncompensated care costs will help preserve the integrity of trauma care systems. Trauma centers with disproportionate financial losses

---

from uncompensated trauma care and those taking on additional burdens because of closures of other trauma centers are good candidates for receiving such funds.

# Trauma Centers Included in GAO Review

---

## Chicago

Christ Hospital and Medical Center  
Cook County Hospital  
Illinois Masonic Hospital  
Loyola University Medical Center  
Michael Reese Hospital and Medical Center  
University of Chicago Medical Center

---

## Detroit

Detroit Receiving Hospital  
Henry Ford Hospital  
Mt. Carmel-Mercy Hospital  
St. John Hospital

---

## Los Angeles

California Medical Center  
Cedars-Sinai Medical Center  
Daniel Freeman Memorial Hospital  
Huntington Memorial Hospital  
Memorial Hospital of Long Beach  
Pomona Valley Community Hospital  
Presbyterian Intercommunity Hospital  
Queen of Angels/Hollywood Presbyterian Medical Center  
St. Mary Medical Center  
University of California, Los Angeles, Medical Center

---

## Miami

AMI Parkway Medical Center  
Baptist Hospital  
Hialeah Hospital  
Jackson Memorial Medical Center  
Mercy Hospital  
Mt. Sinai Hospital  
South Miami Hospital

---

## San Diego

Mercy Medical Center  
Palomar Medical Center  
Scripps Memorial Hospital  
Sharp Memorial Medical Center  
University of California, San Diego, Hospital



---

**Washington, D.C.**

District of Columbia General Hospital  
Greater Southeast Hospital  
Washington Hospital Center

# Medicaid Program Trauma Care Cost Reimbursement

Because Medicaid is a federally aided, state-administered medical assistance program, reimbursement and program eligibility criteria vary from state to state. In most of the areas in our review, Medicaid program reimbursement did not cover trauma care costs. Medicaid losses reported by the trauma centers that gave detailed financial data ranged from \$58,000 to \$3.3 million annually. In a recent ruling, the Supreme Court decided that hospitals have the right to challenge the adequacy of Medicaid reimbursements in federal court. At least 13 states have filed lawsuits challenging the adequacy of Medicaid payments. The ruling may force an increase in state and federal spending for health care.

Some Medicaid programs use per diem fee schedules to reimburse trauma centers for trauma care. The programs pay hospitals a set fee for treating low-income trauma patients regardless of type of injury. Yet, other states use a prospective payment system, the same as or similar to the Medicare program's payment method.<sup>1</sup> Under this system, hospitals are paid a predetermined amount for each case according to the patient's diagnosis or the diagnosis-related group (DRG) into which the case falls. DRGs are sets of medically related diagnoses for which the cost of treating patients is expected to be similar.

The DRG payment rates are based on the average costs of hospitals to treat patients falling under the DRG. This payment system is not designed to pay the actual costs of each patient but to cover the average costs of all patients treated in a DRG. It is expected that the DRG payment will overcompensate hospitals for less severe cases in a DRG and undercompensate for more severe cases, but on average an efficient hospital should receive sufficient payment to cover its costs.

Where trauma systems are in place, specialized trauma care centers are likely to receive a disproportionate number of these severely injured patients. To the extent that these trauma centers treat a disproportionate share of more severe cases, studies show that the averaging aspect of the DRG may not adequately compensate even efficient centers for their costs, especially for cases with multiple injuries. However, hospitals also may receive enough less severe cases in their trauma center and other parts of the hospital to offset the payment effect of the severe trauma cases.

<sup>1</sup>The Medicare program includes coverage for hospitalization of the elderly and is federally administered. While the majority of trauma patients are under age 65 and ineligible for health care coverage under the Medicare program, at least 14 state Medicaid programs use Medicare's DRG payment method or a variation of it. Some states use it for all payers.

Before October 1, 1990, there were no specific DRGs to which multiple trauma cases were assigned. However, the Health Care Financing Administration of the Department of Health and Human Services (DHHS) recently adopted new Medicare DRGs for multiple trauma. The new DRGs, which went into effect October 1, 1990, will result in more homogenous groupings of trauma cases and improve payments for trauma care, HHS officials believe.

# Profits and Losses Reported by 35 Trauma Centers in Six Urban Areas

Numbers in thousands		
Trauma centers' location/status	Net profit	Net loss
<b>Chicago</b>		
Open		
A	•	\$3,570
B	•	1,652
C	•	899
Closed		
D	•	\$2,000
E	•	1,184
F	•	2,500
<b>Total</b>	•	<b>\$11,805</b>
<b>Detroit</b>		
Open		
A	•	\$2,500
B	•	5,000 <sup>a</sup>
C	•	2,400 <sup>a</sup>
D	•	N/A <sup>b</sup>
<b>Total</b>	•	<b>\$9,900</b>
<b>Los Angeles</b>		
Open		
A	•	\$2,500
B	•	3,700
C	•	3,700
D	•	950
E <sup>c</sup>	0	0
Closed		
F	\$618	•
G	•	\$2,000
H	•	5,300
I	•	250
J	•	3,600
<b>Total</b>	<b>\$618</b>	<b>\$22,000</b>

(continued)

**Appendix III**  
**Profits and Losses Reported by 35 Trauma**  
**Centers in Six Urban Areas**

<b>Trauma centers' location/status</b>	<b>Net profit</b>	<b>Net loss</b>
<b>Miami</b>		
Open		
A	•	\$7,383
Closed		
B	•	1,000
C	•	900
D	•	1,690
E	N/A	N/A
F	•	3,000
G	•	100
<b>Total</b>	<b>•</b>	<b>\$14,073</b>
<b>San Diego</b>		
Open		
A	•	\$550
B	\$511	•
C	•	1,131
D	•	2,070
E	•	500
<b>Total</b>	<b>\$511</b>	<b>\$4,251</b>
<b>Washington, D.C.</b>		
Open		
A	•	\$1,853
B	•	7,128
Closed		
C	•	1,800
<b>Total</b>	<b>•</b>	<b>\$10,781</b>
<b>Grand Total</b>	<b>\$1,129</b>	<b>\$72,810</b>

Note: For each center, the figures shown are for 1989 or the latest year for which data were available.

<sup>a</sup>Loss includes emergency care and trauma care. Separate trauma financial data were not available.

<sup>b</sup>This hospital experienced a total loss of \$20 million dollars for 1989 and recently was taken over by another hospital group. Hospital officials said that a cumbersome financial data system prevented them from providing an estimate of trauma care losses.

<sup>c</sup>This hospital broke even.

---

# Major Contributors to This Report

---

## Human Resources Division, Washington, D.C.

Janet L. Shikles, Director for Health Financing and Policy Issues  
(202) 275-5451  
Michael F. Gutowski, Assistant Director  
James O. McClyde, Assignment Manager  
Virginia T. Douglas, Reports Analyst

---

## Detroit Regional Office

Ronald A. Vieregge, Evaluator-in-Charge  
Valerie L. Giles-Reynolds, Site Senior  
Dea M. Crittenden, Evaluator  
Cynthia L. Giacona-Wilson, Evaluator  
Suzanne S. McGillen, Evaluator

---

### **Ordering Information**

The first five copies of each GAO report are free. Additional copies are \$2 each. Orders should be sent to the following address, accompanied by a check or money order made out to the Superintendent of Documents, when necessary. Orders for 100 or more copies to be mailed to a single address are discounted 25 percent.

U.S. General Accounting Office  
P.O. Box 6015  
Gaithersburg, MD 20877

Orders may also be placed by calling (202) 275-6241.

United States  
General Accounting Office  
Washington, D.C. 20548

Official Business  
Penalty for Private Use \$300

First-Class Mail  
Postage & Fees Paid  
GAO  
Permit No. G100